



NASA STTR 2014 Phase I Solicitation

T8.02 Next Generation Total Lightning Detection Sensor

Lead Center: KSC

Participating Center(s): GSFC, LaRC, MSFC, SSC

NASA is concerned with the uncertainty of the current lightning detection sensors NASA is concerned with the uncertainty of current lightning detection sensors. The location accuracy and detection efficiency are both lacking, currently at less than 90% and 250m respectively. Total lightning detection with location accuracy in the meters should be the requirement of the next generation launch vehicle and ground operations. NASA seeks to foster research and development that leads to innovative new technologies and methods, or significant improvements in existing technologies, for in-cloud and cloud-to ground lightning detection. The current total lightning detection technology has been fairly stagnant for the last decade, with the only improvements being small tweaks to location accuracy and classification algorithms and requiring both a suite of cloud-to-ground sensors and inter-cloud sensors. The combination is cost prohibitive to most locations and requires a large array of sensors spanning tens of meters to create solutions. Through current collaborations with other government agencies, the NASA team has come across several universities and at least two small businesses that have conceptual designs that could potentially deliver a brand new sensor with the detection capability to meet the important technology gap. Based on an early assessment of these small business and university concepts, it is likely that systems could be developed within the next 2-3 years, at great cost efficiencies for NASA while providing the needed detection and location accuracy.

Under this subtopic, proposals are invited that explore novel sensors and sensor systems for the detection of both inter-cloud and cloud-to-ground lightning. With regard to detection efficiency and location accuracy, the emphasis is developing systems that have a near total detection and are accurate within 10s of meters. Approaches that use multiple sensors in combination to improve detection and location are also of interest. Technologies may take the form of prototypes and/or devices.